DEPARTMENT OF HEALTH AND HUMAN SERVICES PUBLIC HEALTH SERVICE FOOD AND DRUG ADMINISTRATION	APPLICATION FOR A VARIANCE FROM 21 CFR 1040.11(c) FOR A LASER LIGHT SHOW, DISPLAY, OR DEVICE	Form Approved: OMB No. 0910-0025 Expiration Date: October 31, 1991 See Page 4 for OMB Statement DOCKET NUMBER

NOTE: No laser light show, projection system, or device may vary from compliance with 21 CFR 1040.11(c) in design or use without the approval of this application in accordance with 21 CFR 1010.4.

INSTRUCTIONS

1. Check all applicable boxes and type or print the requested information.
2. Submit an original and four (4) copies.
3. Mail your application to the Dockets Management Branch (HFA-305), Food and Drug Administration, Room 4-62, 5600 Fishers Lane, Rockville, MD 20857.
4. Enter docket number if assigned.

1. NAME OF COMPANY
Lightwave Laser Productions

2. ADDRESS OF COMPANY *(Include ZIP CODE) (If P.O. Box is used, include actual street address also.)*
217 Country Club Road Washington, PA 15301

3. NAME AND TITLE OF RESPONSIBLE PERSON	4. TELEPHONE NO. *(Include area code)*	5. DATE OF SUBMISSION
George Dodworth - Owner	**(412) 965-2737**	**10-1-99**

6. THE APPLICANT REQUESTS THE VARIANCE TO BE IN EFFECT FOR A PERIOD OF **2** YEARS FROM THE DATE OF ISSUE. *(In general, the Agency will approve a variance for only two years. If a longer period is requested, a justification must be attached as part of the application.)*

7. **PRODUCT DESCRIPTION AND USE**

a. LIST NAME AND/OR MODEL NUMBER(S) FOR THE LASER LIGHT SHOW(S) AND PROJECTOR(S)
Shows will be produced under a variety of names; ie "Christmas Laser Fantasy"

b. PRODUCT FOR WHICH A VARIANCE IS REQUESTED
- ☐ A laser display device
- ☐ A projector for a laser light show
- ☒ A laser light show
- ☐ Other *(Specify)*_____

c. ☐ Projectors are intended for sale, lease, or loan to other laser light show producers

d. PRODUCT IS INTENDED FOR USE IN A
- ☒ Planetarium or other dome projection structure
- ☒ Theater
- ☒ Hotel/motel ballroom or meeting room
- ☒ Store displays
- ☒ Trade show or convention
- ☒ Discotheque or night club
- ☒ Pavilion
- ☒ Indoor arena
- ☒ Outdoor arena
- ☒ Museum
- ☒ Outdoor unenclosed area
- ☐ Other *(Specify)*_____

e. PRODUCT IS INTENDED TO BE USED
- ☐ At only one *(Fixed)* location
- ☒ At a variety of *(Tour)* locations
- ☐ Other *(Specify)*_____

f. PRODUCT IS INTENDED TO BE USED AT ANY ONE LOCATION
- ☐ More than 15 days
- ☐ More than 5 but not more than 15 days
- ☒ Less than 5 days

g. TOUR IS INTENDED TO RUN FOR
- ☒ More than 6 months
- ☐ 1-6 months
- ☐ Less than one month
- ☐ Not applicable *(Not a tour)*
- ☐ Other *(Specify)*_____

h. PRODUCT UTILIZES THE FOLLOWING LASER EFFECTS
- ☒ Front screen projections
- ☒ Rear screen projections
- ☐ Holographic displays
- ☒ Multiple reflection/diffraction effects
- ☐ Audience scanning *(Also includes scanning any accessible uncontrolled areas)*
- ☒ Reflections from stationary mirrors or mirrored surfaces *(Beam Matrices)*
- ☐ Stationary irradiation of rotating mirror balls, etc.
- ☐ Scanning irradiation of rotating mirror balls, etc.
- ☒ Fiber optic projections
- ☒ Fog, smoke, or other scattering enhancement effects
- ☐ Other *(Specify)*_____

8 **LASER RADIATION LEVELS**

LASER MEDIUM *(Ar, He-Ne, etc.)*	WAVE LENGTHS *(nm)*	PEAK POWER *(watts)*
Argon/Krypton	**458, 476, 482, 488, 528, 530, 647, 676 nm**	**20W**
HeNe	**632.8nm**	**35mW**
Nd:Yag	**532nm**	**40W**

9 IF ANY LASER RADIATION IS PULSED OR SCANNED, GIVE THE PULSE DURATION AND RATE AND SCANNING FREQUENCY AND AMPLITUDE

Nd:Yag Lasers:
10Khz - 25Khz Typical Pulse Repetition Frequency
(Models under 5W Typically CW)

Scanning System - Frequency: DC - 1Khz Typical
Amplitude: 0 - 60 Degrees (mechanical)

10. REASON FOR REQUESTING VARIANCE

- ☒ Compliance with the limits of 21 CFR 1040.11(c) would restrict the intended use of the product because compliance would limit the output power to the extent that the desired effects would not be sufficiently visible
- ☐ Other or additional explanation *(Specify)*_____

99V-4395 VAR1

11 MANNER IN WHICH IT IS PROPOSED TO DEVIATE FROM THE REQUIREMENTS OF THE APPLICABLE STANDARD

☒ It is proposed to deviate from the provisions of 21 CFR 1040.11(c) in that the accessible emission level would exceed the accessible emission limits specified in 21 CFR 1040.11(c).

☐ It is proposed to deviate from the provision of 21 CFR 1040.11(c) as follows:

12. ADVANTAGES TO BE DERIVED FROM SUCH DEVIATION

☒ Laser light shows and displays are accepted popular media in entertainment and the arts. Use of power levels in excess of the limits imposed by 21 CFR 1040.11(c) is necessary to achieve the required effects in these media.

☐ Other or additional advantages *(describe and explain)*.

13. EXPLAIN THE ALTERNATE MEANS OF RADIATION PROTECTION TO BE PROVIDED. *(Check as many boxes as apply. In Item 14 "Remarks," justify any boxes not checked, using additional sheets as necessary. State any other means of radiation protection that will be used.)*

a. ☒ All laser products, systems, shows, and projectors will be certified to comply with 21 CFR 1040.10 and the conditions of this variance and will be reported as required by 21 CFR 1002.10 and 1002.12 using the reporting guides provided for such purpose. These actions will be accomplished prior to any introduction into commerce.

b. ☒ Effects not specifically indicated in this variance application will not be performed. No other effects will be added until an amendment to the variance has been obtained and the required reports or supplements, as applicable, have been submitted.

c. ☒ Scanning, projection, or reflection of laser and collateral radiation *(Light show radiation)* into audience or other accessible uncontrolled areas will not be permitted except for diffuse reflections produced by the atmosphere, added atmospheric scattering media, and target screens.

d. ☒ Laser radiation levels in excess of the limits of Class I will not be permitted at any point less than 3.0 meters above any surface upon which persons other than operators, performers, or employees are permitted to stand or 2.5 meters below or in lateral separation from any place where such persons are permitted to be. Operators, performers, and employees will not be required or allowed to view radiation above the limits of Class I or be exposed to radiation above the limits specified in 21 CFR 1040.11(c).

e. ☐ Any product which relies on scanning to meet access, exposure, or product class limits will incorporate a scanning safeguard system which directly senses scanner motion and which will react fast enough to preclude exceeding the applicable limit.

f. ☒ All laser light shows shall be under the direct and personal control of trained, competent operator(s). The operator(s) will:

(1) Immediately terminate the emission of light show radiation in the event of any unsafe condition;

(2) Be located where all beam paths can be directly observed at all times; and

(3) Be an employee of the variance holder who will be responsible for the training and the conduct of the operator.

g. ☒ The maximum laser projector output power will not exceed the level required to obtain the intended effects.

h. ☒ The projection system *(i.e., the projector and all other components used to produce the lighting effects)* will be securely mounted or immobilized to prevent unintended movement or misalignment. Beam masking will be provided as an inherent part of the system design to prevent overfilling of screens, beam stops, targets, etc.

i. ☒ Laser projectors will not be delivered to any other party under an agreement of sale, lease, or loan unless and until the recipient demonstrates that they have a variance in effect at the time of delivery that permits them to produce laser light shows incorporating such projector(s).

j. ☒ In addition to the requirements of 21 CFR 1040.10(h), the manufacturer of laser projectors/systems will provide to parties who purchase, lease, or borrow the equipment, adequate users' instructions for safe installation and operation which explain the responsibility of the recipient as an independent light show manufacturer to submit the required reports and apply for and obtain a variance from CDRH prior to introduction into commerce of any laser light shows.

k. ☒ The requirements of 21 CFR 1002.30(a)(1) and (2) will be accomplished through the use of written procedures for setup, alignment, testing, and performance of each show. These procedures will be in sufficient detail to ensure compliance with 21 CFR 1040.10, the conditions of this variance, and the control of access to radiation areas using the procedures described in the ANSI Z136.1 standard for the safe use of lasers *(American National Standards Institute, 1430 Broadway, New York, NY 10018)* or any other equivalent user consensus standard and, where applicable, state or local requirements. Laser radiation areas which can contain radiation levels above the limits specified in 21 CFR 1040.11(c) will be clearly identified by the posting of warning signs and/or restricting access through physical means *(such as pressure switches, photo cells, barriers, guards, etc.)*. These requirements apply to temporary areas *(such as during set up and alignment procedures)* and to final or permanent areas. The variance holder will retain the records of these procedures and the results of all tests as required by 21 CFR 1002.31. A copy of the variance application, the approval letter, current procedures, and records relating to each particular show will be with the operator or other responsible individual and will be made available for inspection by FDA and other responsible authorities.

I. ☒ Advance written notification will be made as early as possible to appropriate federal, state, and local authorities providing show itinerary with dates and locations clearly and completely identified, and a basic description of the proposed effects including a statement of the maximum power output intended. Such notifications will be made, but not necessarily be limited, to:

(1) The Center for Devices and Radiological Health, Office of Compliance and Surveillance (HFZ-312), 1390 Piccard Drive, Rockville, MD 20850, providing the initial and closing dates for fixed installations and the itinerary for mobile shows. In addition, unless all aspects of each show have been reported and accession numbers clearly referenced, each notice will include detailed descriptions of each show and a listing of all effects to be performed in sufficient detail to confirm compliance with the regulations and this variance.

(2) The Federal Aviation Administration (FAA) for any projections into open airspace at any time *(i.e., including set up, alignment, rehearsals, performances, etc.)*. If the FAA objects to any laser effects, the objections will be resolved and any conditions requested by FAA will be adhered to. If these conditions cannot be met, the objectionable effects will be deleted from the show.

(3) State and local radiation control offices/agencies for all shows to be performed within their jurisdictions. All requirements of state and local law will be satisfied and any objections raised by local authorities will be resolved or the effects deleted. *(A list of federal and state offices is available from the Center for Devices and Radiological Health upon request.)*

14. REMARKS

The owner of the company is a graduate of a 5 year Electrical Engineering program at Penn State University. The owner also completed a minor in Physics, with a concentration in Advanced Optics. All show configurations will be designed by the owner to insure all requirements of this variance, and the safety standards set forth in ANSI 136.1 are upheld to the highest standards.

CERTIFICATION

I CERTIFY that all of the above information and statements are true, complete, and correct to the best of my knowledge and acknowledge that my variance application may be denied or my variance may be revoked if this application is found to be false, misleading, or incorrect in any material way. I have submitted and will submit all reports required by 21 CFR 1002.10 and 1002.12 on the laser equipment and show(s). I further understand that I may be required by regulation or by the Director, Center for Devices and Radiological Health, to supply such other information as may be necessary to evaluate and act on this application.

15. SIGNATURE	16. NAME *(Type or Print)*	17. TITLE
George Dodworth	George Dodworth	Owner - Lightwave Laser Productions BSEE / Physics

Public reporting burden for this collection of information is estimated to average 5 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send **COMMENTS** regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to:

Reports Clearance Officer, PHS
Hubert H Humphrey Building, Room 721-B
200 Independence Avenue, S.W.
Washington, DC 20201
Attn: PRA

and to:

Office of Management and Budget
Paperwork Reduction Project (0910-0025)
Washington, DC 20503

Please DO NOT RETURN this application to either of these addresses.

LIGHTWAVE
LASER PRODUCTIONS
Experts in LASER Lighting Design
PO Box 113491
Pittsburgh, PA 15241
(412) 96-LASER

October 6, 1999

Office of Compliance
Center for Devices and Radiological Health
2098 Gaither Road
Rockville, Maryland 20850

Dale:

Enclosed, please find my Laser Light Show Report, Variance Application, and all supporting documentation. As we discussed a couple of weeks ago, I am anxious to enter a projector into commerce so that my new business may begin generating income as soon as possible. Any assistance to expedite this application would be greatly appreciated.

I look forward to working with you in the future as I begin generating model reports, and submitting show notifications. I will work hard to respond to any requests you may have in a timely manner.

Sincerely,

George Dodworth

George Dodworth
Owner – Lightwave Laser Productions

OCTOBER 14, 1999

DOCKET NUMBER: 99V-4395

TITLE: Laser Light Show
ACTION OFFICE: HFZ-215

FA, /CAP/GRASP Number:

ITEM CODE	RECEIVED MM DD YY	FILED MM DD YY	P C	SUBMITTER	FR DATE	FR PAGE	COM/OBJ MM DD YY	VOL	MISCELLANEOUS
VAR1	10/12/99	10/12/99	C	Lightwave Laser Productions Signature: George Dodworth				1	ACK 1
ACK1	10/12/99	10/12/99	E	HFA-305 Signature: Helen K. Harris				1	